2006 – 2012 ACTION PLAN

QUÉBEC AND CLIMATE CHANGE
A Challenge for the Future

JUNE 2006

SHINE AMONG THE BEST

Québec

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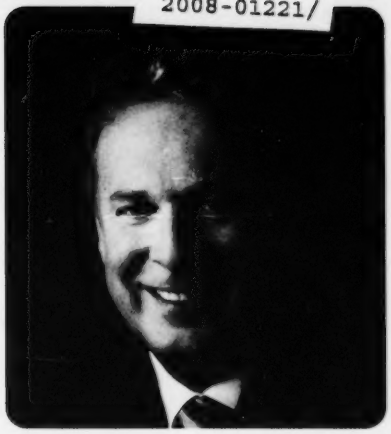


A WORD FROM THE PREMIER

Québec is confirming its ambition to take the lead in sustainable development on the continent with the release of its 2006-2012 climate change action plan, entitled *Québec and Climate Change – A Challenge for the Future*.

After the Sustainable Development Act and the energy strategy, the government is taking the next step towards building a society that is mindful of the well-being of current generations and the fulfillment of future generations.

The meaning of the efforts undertaken

Climate change is one of the greatest environmental challenges of modern time. To rise to this challenge, everyone must do their share, and this is the focus of Québec's action plan.

Climate change engages governments on two levels. With the knowledge that global warming has already had irreversible impacts, greenhouse gas (GHG) emissions must be reduced and climate change adaptation actions must be taken.

An outstanding contribution

Québec has the best record in Canada for GHG emissions per capita. This is due to the good performance of its manufacturing sector, the increased use of public transportation, a more energy-efficient automobile fleet and, especially, due to the prominence of a clean, renewable energy source – hydroelectricity – in its energy budget.

All Quebecers can be very proud of Québec's outstanding contribution to making the planet a greener place today and for the generations to come. By embracing sustainable development, we are taking charge of our well-being and that of our neighbours.

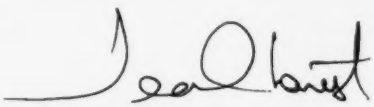
Respecting the Kyoto Protocol

The Kyoto Protocol is the first collective response to climate change. Québec has commited itself to heading in that direction and all Quebecers are ready to act. The action plan that the government is proposing is an ambitious one. It includes the means required to meet precise reduction objectives and major financial commitments of $1.2 billion over six years, that is, $200 million a year.

It is possible to do more. The federal government must do its share, of course, and that is the reason behind our government's initiative to introduce the motion that was unanimously approved by the National Assembly of Québec on May 24. I am convinced that a sense of duty will lead the federal government to unite its efforts with those of Québec by acting in its own fields of intervention and making good use of the considerable resources it has at its disposal.

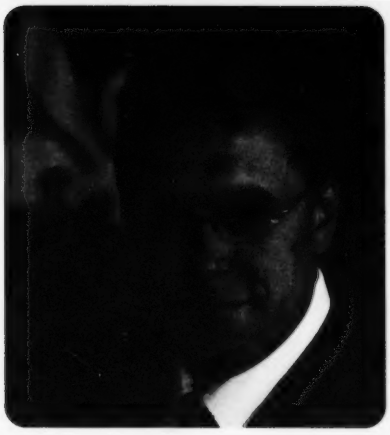
An action plan for all Quebecers

The action plan, *Québec and Climate Change – A Challenge for the Future*, calls on all Quebecers. Everyone – individuals, organizations and companies alike – must feel the need to get involved. The success of this initiative is depending on it. I am confident that it is within our ability to succeed.



Jean Charest
Premier of Québec

A WORD FROM THE MINISTER



For the first time, Québec has a climate change action plan with objectives that are truly ambitious as well as the means to achieve them.

Québec at the forefront

Québec's climate change action plan, entitled *Québec and Climate Change – A Challenge for the Future*, marks a crucial step in our government's action to build a society in which sustainable development is at the centre of priorities and collective choices. It allows Québec, as a North American government, to take a leading role in the fight against climate change.

Precise targets, clearly defined means

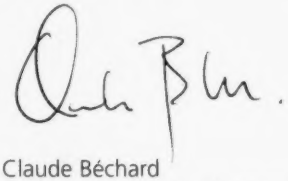
The action plan sets forth precise targets and identifies the initiatives undertaken to meet the 2012 Kyoto Protocol objectives. With the actions we are putting forth, we want Québec to be able to reduce its greenhouse gas emissions by 10 million tonnes, letting the federal government take its responsibilities by financing an additional reduction of 3.8 million tonnes in order to obtain an emission level of 6% under the 1990 level in Québec. At the same time, we are taking the steps necessary to adapt our lifestyle and habits in a world where climate change is already underway.

Implementation of the action plan will be made possible through new funding in the amount of $1.2 billion over six years, that is, $200 million a year to be paid into the Green Fund. Thanks to this fund, we are providing additional means for the efforts already announced in the new energy strategy. I would like to point out the quality of the work that has been done by the departments and organizations, which each contributed to this vast undertaking in their respective fields.

The urgency to act

This climate change action plan, *Québec and Climate Change – A Challenge for the Future*, is effective immediately. Indeed, Québec must take action now so that current and future generations may rise to the most significant environmental challenge of our time.

Quebecers can count on our government to encourage and support the efforts of each and all.



Claude Béchard
Minister of Sustainable Development,
Environment and Parks

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1. QUÉBEC'S CONTRIBUTION IN THE FACE OF A GLOBAL CHALLENGE

THE FIGHT AGAINST CLIMATE CHANGE POSES TREMENDOUS CHALLENGES, ASSUMING OF COURSE THAT LIVING IN A HEALTHY ENVIRONMENT AND BREATHING FRESH AIR IS A RIGHT WE WISH TO ENJOY AS WELL AS PASS ON TO OUR CHILDREN. CLEARLY, IMPLEMENTATION OF THE KYOTO PROTOCOL DEMANDS DISCIPLINE AND PERSEVERANCE IF WE ARE TO MAKE IT TO THE FINISH LINE. WHETHER AS INDIVIDUALS OR AS MEMBERS OF SOCIETY, THIS IS A FIGHT THAT CONCERNS US ALL, AND IT MUST BE WON ON BEHALF OF FUTURE GENERATIONS.

THIS FIGHT AGAINST CLIMATE CHANGE REQUIRES IMMEDIATE, CONCERTED ACTION. WE MUST WORK WITH WHAT WE HAVE NOW TO ENSURE THE QUALITY OF LIFE TO WHICH WE ASPIRE, TO PROTECT OUR ECOSYSTEMS AND INFRASTRUCTURES, AND TO KEEP OUR ECONOMY COMPETITIVE. IT IS THE DUTY NOT ONLY OF OUR GOVERNMENT LEADERS AND THE SCIENTIFIC COMMUNITY, BUT ALSO OF ALL INDIVIDUALS, INSTITUTIONS AND COMPANIES THAT MAKE UP OUR SOCIETY.

QUÉBEC ALREADY HAS A GOOD TRACK RECORD IN LIMITING GREENHOUSE GAS (GHG) EMISSIONS, NOTABLY DUE TO ITS MASSIVE INVESTMENTS IN THE PRODUCTION OF CLEAN ENERGY IN THE FORM OF ELECTRICITY. WITH THE 2006-2012 ACTION PLAN ADOPTED BY THE GOVERNMENT, QUÉBEC IS DECIDEDLY TAKING THE LEAD IN SUSTAINABLE DEVELOPMENT IN NORTH AMERICA BY GIVING ITSELF THE MEANS TO BRING ITS EMISSIONS UNDER THE 1990 LEVEL.

Ministère des Ressources naturelles et de la Faune

Ministère des Ressources naturelles et de la Faune

1.1
CLIMATE CHANGE: THE GREATEST ENVIRONMENTAL CHALLENGE THE PLANET IS FACING

1.1.1 Impacts of concern

According to the *Third Assessment Report of the Intergovernmental Panel on Climate Change* (IPCC)[1], published in 2001, the average surface temperature of the Earth will increase by 1.5°C to 5.8°C by 2100, and warming in North America's northern regions could be 40% greater than the average. Precipitation is projected to increase, as well as the frequency or intensity of extreme events like heat waves, heavy precipitation and droughts. Also projected is an increase in mean sea level and a decrease in the extent of snow cover and sea ice in the northern hemisphere, as has already been observed in the second half of the 20th century.

Warming is expected to occur throughout Québec, with more intense warming in northern areas and in Hudson Bay. Variations in precipitation are also projected to occur across the territory, and possibly more frequent episodes of intense heat, droughts and winter warm spells. Finally, the projected sea level rise could cause flooding and increased coastal erosion.

Already, average temperatures in western and central Québec between 1960 and 2003 increased by 0.75°C to 1.25°C. Warming has occurred more slowly in the east (less than 0.75°C for the same period). In the North, the significant increase in temperatures, observed sincé the mid-1990s, has notably caused the permafrost to warm.

[1] Work group created in November 1988 by the United Nations and the World Meteorological Organization further to the World Conference on the Changing Atmosphere held in Toronto in June 1988.

1.1.2 Limiting global warming

The most recent international findings suggest that increased global warming of more than 2°C, compared to average temperatures during the preindustrial era, could have serious repercussions on human activities, biodiversity and the security of populations. Even if with current knowledge there is some uncertainty surrounding the evaluation of this critical warming threshold, the forecast is nonetheless very worrisome considering that Québec, situated as it is in the mid to upper latitudes, will experience more warming than most territories around the globe.

Québec therefore welcomes the idea of limiting warming to under the 2°C threshold, taking into consideration however that because of its northern location the threshold is already likely to be too high to prevent major climate-related perturbations from occurring on its territory. All the necessary means available must therefore be taken to limit climate warming as much as possible.

1.1.3 Protecting public security

Climate change threatens the security of people and the integrity of various infrastructures and constructions, notably in northern and coastal areas. It also poses a threat to natural resources, by affecting their abundance and quality and rendering ecosystems more fragile. Since emission reductions planned further to the Kyoto Protocol's implementation will not sufficiently slow climate change, Québec has no choice but to implement efficient adaptation measures.

UNDERSTANDING THE GREENHOUSE EFFECT

Certain naturally occurring gases in the Earth's atmosphere trap heat close to the Earth's surface. They are called "greenhouse gases" (GHGs). Without these gases, the average temperature on our planet would be –18°C instead of approximately 15°C, and life as we know it would be impossible. The key GHG generated by human activities is carbon dioxide. Its symbol is CO_2.

Earth receives most of its energy from the Sun, part of which is absorbed by the Earth's surface and part of which is reflected back into the atmosphere. GHGs trap a portion of this energy and, as a result, heat the atmosphere. This process is called the "greenhouse effect."

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1.2
THE KYOTO PROTOCOL: A NECESSARY FIRST STEP

Climate change concerns all countries and all governments on the planet. Moreover, it requires concrete actions at several levels: international, national, regional, local and, also, individual. To date, 163 countries have ratified the Kyoto Protocol. It must be noted, however, that several countries, including China and India, have no constraining reduction objectives, which means they have no quantifiable commitments for GHG emission reductions. Canada ratified the Kyoto Protocol in 2002 with a commitment to reduce its GHG emissions by 6% under the 1990 level for the period between 2008 and 2012.

The United States and Australia signed the Protocol in 1997 but, since they did not ratify it, they have no constraining reduction objectives. In economic terms, this means that with no emission reduction targets these trading partners have a competitive advantage over companies in Québec. Therefore, the emission reduction targets that Canada could impose on Québec's big companies must reflect the global market context and their reduction capacity, and take into account the actions our society has taken since 1990. The companies must be environmentally innovative, which will enable them to be both more efficient and productive, while reducing their GHG emissions.

Since 1992, Québec has always supported Canada's position on the Climate Change Convention signed at the Earth Summit in Rio that same year. In this regard, a motion introduced in the National Assembly on April 21, 2005, was unanimously adopted, and a second motion, introduced on May 24, 2006, was also voted on: "That the National Assembly of Québec ask the federal government to respect its international commitments and the GHG reduction objective as established by the Kyoto Protocol by making a financial contribution to the implementation of Québec's Climate Change Action Plan."

Also, the Québec Government is an active partner of the *Conference of New England Governors and Eastern Canadian Premiers Climate Change Action Plan* released in 2001. This plan's aim is to focus on regional, national and international collaborations for the purpose of reducing GHG emissions by 10% under 1990 level by 2020 and adapting to climate changes, and creating new partnerships to gain a better understanding of climate change and identify sustainable solutions for the causes.

Since 1988, the Québec Government has also been working with the Institut de l'énergie et de l'environnement de la Francophonie, notably by taking part in capacity building activities that this institute organizes for developing countries.

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

Adopted in 1992 and ratified by 189 countries, the UNFCCC sets an overall framework to tackle the challenge posed by climate change. Under the Convention, governments must collect information on GHGs, launch national strategies for addressing GHG emissions and cooperate in preparing for adaptation to the impacts of climate change.

The ultimate objective of the Convention is to achieve stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Some 40 industrialized countries, including Canada and the United States, also committed to returning their GHG emissions to their 1990 levels by the year 2000.

THE KYOTO PROTOCOL

When they adopted the Framework Convention on Climate Change, the governments knew that its commitments would not suffice to significantly slow climate change. It is for this reason that in 1997 they adopted the Kyoto Protocol, as an annex to the Convention.

The Protocol shares the Convention's objective, but significantly strengthens it by committing industrialized (Annex I) countries to individual, legally-binding targets to limit or reduce their GHG emissions. The average reduction objective, committed to by the industrialized countries, is 5.2% under the 1990 level for the 2008-2012 period. Canada's objective is 6% under this level. To date, the Kyoto Protocol has been ratified by 163 countries.

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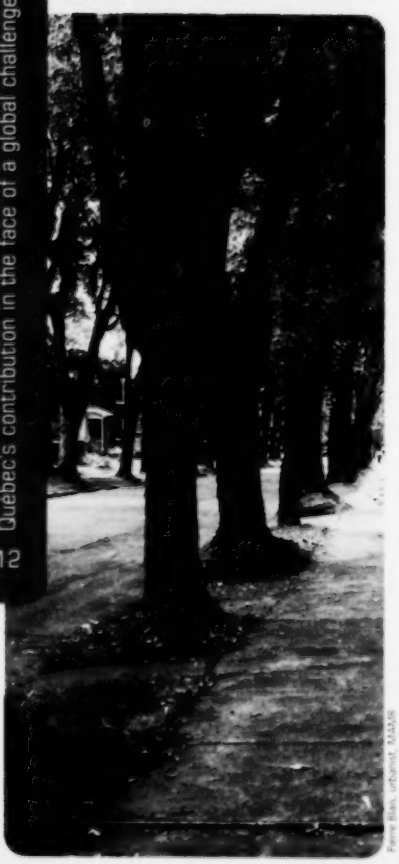
Denis Bruneau © Le Québec en images, CCMD

Ministère des Ressources naturelles et de la Faune

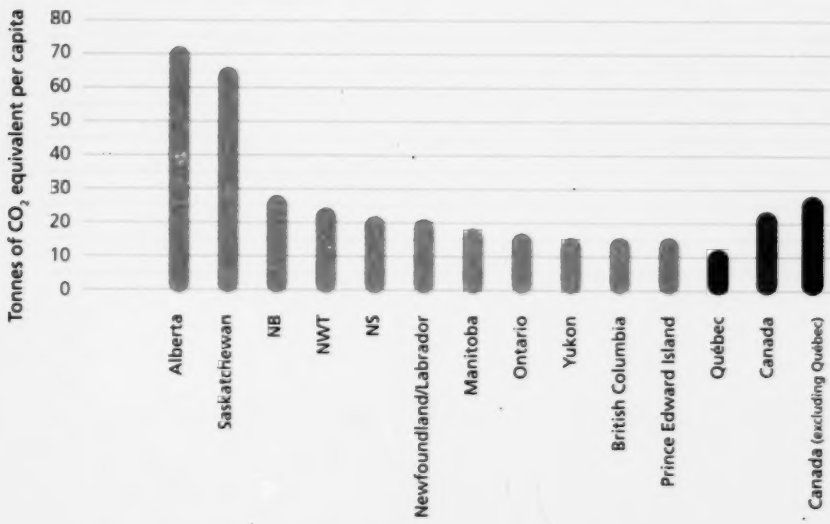


Pierre Blais, collaboré, MAMR

1.3
QUÉBEC'S GHG EMISSIONS: A SOLID CONTRIBUTION

In 2003[2], Québec had the best GHG emissions record in Canada. Statistics show that its emissions represented an average of **12.1 tonnes of CO_2 equivalent per capita** compared to 16.8 tonnes of CO_2 equivalent for Ontario and 71 tonnes of CO_2 equivalent for Alberta. The Canadian average was 23.4 tonnes of CO_2 equivalent per capita. It should be noted that by excluding Québec the Canadian average increases to 26.9 tonnes of CO_2 equivalent per capita, higher than that of the United States which, in 2003, stood at 23.4 tonnes of CO_2 equivalent per capita. Québec produced 90.9 Mt of GHGs in 2003 compared to 206.2 Mt for Ontario and 224.4 Mt for Alberta, with Canada's total GHG emissions at 740.2 Mt.

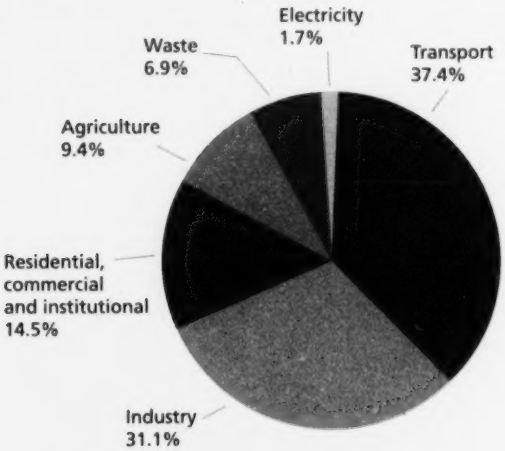
GHG EMISSIONS PER CAPITA BY PROVINCE/TERRITORY AND IN CANADA IN 2003



This good performance is largely attributable to the fact that in the past Quebecers agreed to invest in a clean, renewable energy source – hydroelectricity. In Québec, electricity production represents only 1.7% of emissions on the territory, placing it last as a source of GHG emissions. In Canada, this sector occupies the third rank for GHG emissions.

2 2003 data are the most recent compilations available for Québec.

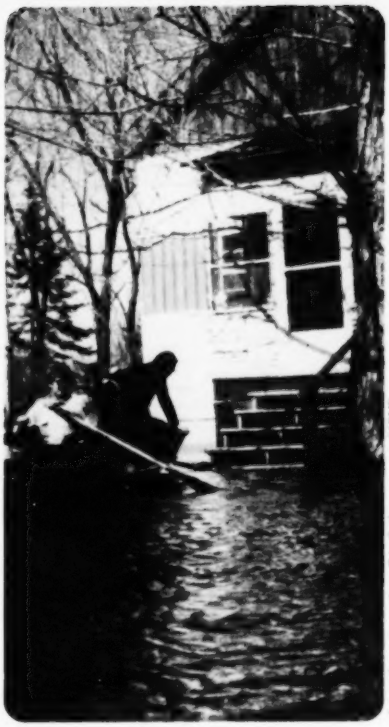
BREAKDOWN OF GHG EMISSIONS BY SECTOR OF ACTIVITY IN QUÉBEC IN 2003

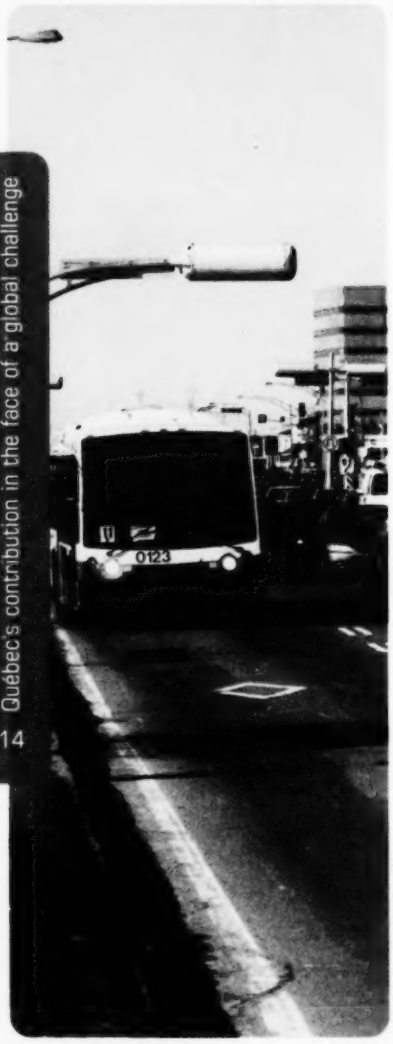


The excellent performance of Québec's manufacturing sector also contributed tremendously to Québec's positive record. Between 1990 and 2003, this sector reduced its overall emissions by 6.8% and emissions from industrial processes by 15.1%. These results are due to the strategic investments Québec's companies made in innovative technologies, which enabled them to improve their processes and energy efficiency. Today, a good number of these companies are leaders in their sectors of activity because they improved their competitiveness while substantially reducing their GHG emissions.

Québec also distinguishes itself in the area of transportation. Its fleet of vehicles has one of the best performances in Canada in terms of energy efficiency and Montreal stands out as one of the cities in North America where public transportation is used most.

However, in spite of this good performance, efforts must continue to be made to reduce GHG emissions. Between 2001 and 2003, GHG emissions in Québec increased by 6%, a trend that could amplify if nothing is done to slow it down.

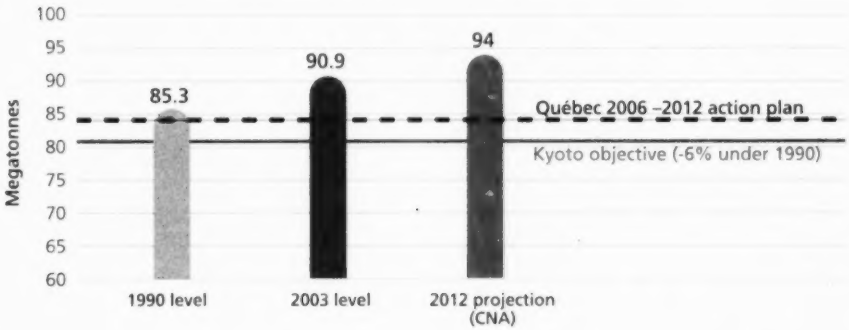




1.4
QUÉBEC IN THE FIGHT AGAINST CLIMATE CHANGE

Although Québec has the best record in Canada with regard to GHG emissions, its emissions have increased since 1990. Québec's GHG emissions in 1990 stood at 85.3 million tonnes (Mt) and increased to 90.9 in 2003. The transportation and building sectors are mostly responsible for this increase. This plan aims primarily to reverse this upward trend in these two sectors by adopting actions that will enable the entire economy to improve its competitiveness and decrease its dependence on fossil energy. Thus, the 2006-2012 Action Plan will enable Québec to reduce its GHG emissions by 10 Mt of CO_2 equivalent, 1.5% under the 1990 level as illustrated in the graph below.

GHG EMISSIONS



This document presents actions to be taken between now and 2012, based on two main objectives:

1. **The reduction or avoidance of greenhouse gases (GHGs).**
2. **Adaptation to climate change**, with an aim to decrease the negative effects and benefit from the positive effects.

[3] Business as usual scenario projects 94 Mt in GHG emissions for 2012 in Québec.

1.4.1 Reducing or avoiding GHG emissions

Over the coming years, Québec must reduce its GHG emissions while maintaining a strong, sustainable economy, and benefiting as much as possible from new economic opportunities arising from climate change and its challenges. In a context where the cost of fossil fuel energy is rising rapidly, energy efficiency is not only preferable but also essential if our companies and economy are to be competitive. Energy plays a crucial role in Québec society. It creates wealth, stimulates investment and employment, generates tax revenues, and contributes to the financial health and competitiveness of our companies. In fact, the high quality of living of Quebecers is due in part to the good performance of its energy sector. These actions are therefore complementary to those stemming from Québec's energy strategy.

Actions to reduce GHG emissions mainly involve energy, transportation, residual materials, agriculture and government operations. The actions targeting research, development and deployment of new technologies (RDD) as well as public awareness will also reduce GHG emissions.

Climate change will have signficant impacts on societies and ecosystems. It will require governments to make their economy less carbon emitting, while facing mounting global competition. In this perspective, governments and societies that are able to adopt this new emerging economy will be able to fully participate in mitigating climate change while being prosperous. Québec is determined to rise to the many challenges that such changes imply while sustainably developing its economy.

As part of the mechanisms set up by the Kyoto Protocol, a carbon market was created to minimize the costs associated with GHG emission reductions. The market is developing quickly both globally and nationally. In addition to making it easier to reach sectoral targets at a lesser cost, it offers interesting development perspectives in several fields, notably the capture of landfill gases and energy recovery, alternative fuels, the production of renewable energy and energy efficiency in the industrial, institutional, commercial and residential sectors, as well as in the area of transportation. In Québec, government aid must not only target research and development (RD) in these sectors, but also support the deployment and commercialization of new technologies so that Québec society can make the most of the benefits that these initiatives generate.

AVOIDED EMISSIONS

The fight against climate change among other things means avoiding the production of new GHG emissions from the production of electricity, heating buildings and industrial processes. In Canada, avoided emissions are calculated on the basis of equivalent energy production by a combined cycle natural gas plant (the most efficient technology among types of thermal plants using fossil fuels), which produce an average 334 tonnes of CO_2 equivalent per gigaWatt/hour (GWh).

1.4.2 Adaptation to climate change

In other respects, how sensitive Québec's economy is to climate change depends on the nature and size of the sectors likely to benefit from changes to the climate or otherwise to suffer from their consequences. Thus, agriculture and the harvesting of natural resources and their transformation could be directly affected by climate change. There will also be impacts on other sectors of the economy, like transportation and industry, and it will be necessary to study the nature and scope of these impacts in order to adapt. In this respect, the government's economic development strategy, published in 2005, highlights as one of our strengths the innovative nature of our companies, notably those in the environmental field, which will have to rise to the challenge.

Adaptation actions are grouped into the categories of health, environment, and resources and the territory. Their purpose will be to protect public health and security, and monitor and protect the environment, thereby reducing our vulnerability to the impacts of climate change for the benefit of current and future generations.

With a surface area of 1.7 million km^2, Québec's territory encompasses a multitude of ecosystems adapted to regional and local climates. The characteristics, scope and speed of climate change could vary depending on each area. Moreover, the effects, both positive and negative, that terrestrial and aquatic ecosystems might undergo will have repercussions on human populations across the territory and on their socioeconomic activities. This means that monitoring changes in climate and impacts on natural and built environments is a necessity. For nearly a decade, Québec has undertaken actions aimed at raising the public's awareness of climate change. Since global warming has already had impacts, these initiatives must be stepped up to further mobilize the population.

2. ACTIONS TO BE TAKEN BETWEEN 2006 AND 2012

THIS PLAN IS COMPOSED OF 24 ACTIONS THAT ARE BASED ON TWO MAJOR OBJECTIVES: **THE REDUCTION OR AVOIDING OF GHG EMISSIONS** AND **ADAPTATION TO CLIMATE CHANGE**. ACTIONS TO REDUCE GHG EMISSIONS PERTAIN TO ENERGY, TRANSPORTATION, RESIDUAL MATERIALS, AGRICULTURE AND GOVERNMENT OPERATIONS. THEY ALSO CONSIST IN RAISING PUBLIC AWARENESS AND SUPPORTING TECHNOLOGICAL INNOVATION. ADAPTATION ACTIONS CONCERN HEALTH, ENVIRONMENT, RESOURCES AND THE TERRITORY.

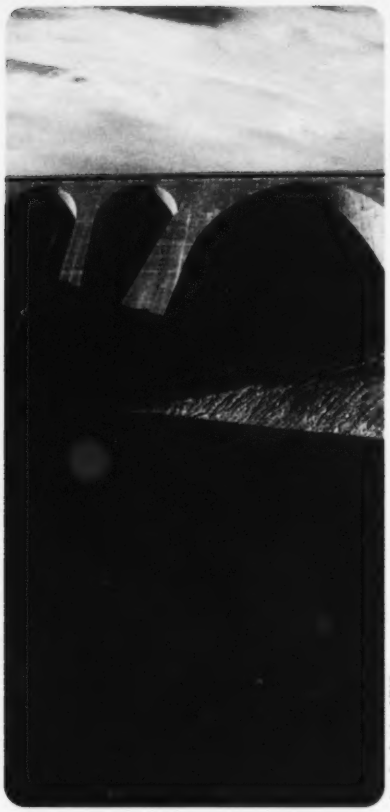
THE ACTIONS PRESENTED IN THIS PLAN WILL ENABLE QUÉBEC TO REDUCE ITS GHG EMISSIONS BY 10 MT OF CO_2 EQUIVALENT OVER THE NEXT SIX YEARS, WHICH WILL REDUCE EMISSIONS TO 84 MT OF CO_2 EQUIVALENT IN 2012, THAT IS, 1.5% UNDER THE 1990 LEVEL. IT IS POSSIBLE TO MEET THIS CHALLENGE IF ALL MEMBERS OF SOCIETY INVEST NOW.

FOR EACH SECTOR, THE GOVERNMENT PRESENTS THE ACTIONS CURRENTLY IN PLACE TO REDUCE OR AVOID GHG EMISSIONS, FOLLOWED BY A SET OF ADDITIONAL ACTIONS (SEE APPENDIX) IT INTENDS TO IMPLEMENT OVER THE NEXT SIX YEARS.

FOUR GUIDING PRINCIPLES SERVE AS THE BASIS FOR THE PLAN'S DESIGN:

1. ASSUMING OUR RESPONSIBILITIES IN OUR FIELDS OF JURISDICTION.
2. ECONOMIC EFFICIENCY, TO PRESERVE THE COMPETITIVENESS OF QUÉBEC'S COMPANIES.
3. COMPLEMENTARITY OF INTERVENTIONS, IN SUCH MANNER AS TO MAXIMIZE THE POSITIVE IMPACTS.
4. THE PARTICIPATION OF ALL MEMBERS OF QUÉBEC SOCIETY: CITIZENS, COMPANIES, MUNICIPALITIES AND PUBLIC INSTITUTIONS.

THE ACTIONS PROVIDED FOR IN THE PLAN ARE WITHIN QUÉBEC'S JURISDICTION, INCLUDING THE PRODUCTION, TRANSPORT AND DISTRIBUTION OF ENERGY, ROAD TRANSPORTATION, THE MANAGEMENT OF LANDFILL SITES, AGRICULTURE, HEALTH, ENVIRONMENT, NATURAL RESOURCES AND LAND MANAGEMENT.



2.1 SECTORAL ACTIONS TO REDUCE OR AVOID GHG EMISSIONS IN QUÉBEC

2.1.1 Energy

For over 50 years, Québec has been making its mark with its expertise in the field of energy by developing its water resources. The production of electricity generates far fewer greenhouse gas emissions in Québec (1.7% of GHG emissions in Québec) than in the rest of Canada (18.1% of the country's GHG emissions) where coal, petroleum and natural gas are the main energy sources. This is explained by the fact that 94% of Québec's electric power is obtained from waterpower, a renewable energy source that does not generate large quantities of GHGs.

Building on this success, Québec intends to pursue development of its hydroelectric potential, but also wishes to invest in new forms of renewable energy while placing an emphasis on decreasing electricity consumption in all sectors of the economy.

In 2003, GHG emissions from hydrocarbons and coal totalled 66.6 Mt or 72.9% of GHG emissions in Québec. Of the total, 52.0% were generated by the transport sector, 20.0% by the mining and manufacturing sectors, 20.3% by the residential, commercial and institutional subsectors, and 7.7% by the energy distribution, transport and production sector.

In May 2006, the Québec Government unveiled its energy strategy, called *Using Energy to Build the Québec of Tomorrow*. This strategy outlines new renewable energy developments (hydroelectricity and wind power), and aims for increased efficiency in the use of all forms of energy including petroleum products.

Hydroelectricity

Hydroelectricity is a source of clean, renewable and climate-friendly energy. Several major hydrolectric projects, with a combined power of 1,054 MW, currently under construction in Québec, will be in service between 2006 and 2012. An environmental assessment is being done of the Eastmain-1-A/Sarcelle Rupert (888 MW) project. Once in operation, these projects will **avoid** nearly **5 Mt of GHG** emissions annually.

In parallel with the 2010 target, the Québec Government will create a portfolio of hydroelectric projects totalling 4,500 MW. These projects will **avoid** nearly **8 Mt in GHG** emissions.

Wind energy

With a view to benefiting from the complementarity of hydroelectricity and wind power, the government is committed to producing 4,000 MW of electricity from wind by 2015. The first 3,000 MW will result in nearly $5 billion in investments and the creation of nearly 2,000 jobs, while **avoiding 2.9 Mt in GHGs** annually. Beyond 2015, the government will ensure that, according to technological advances made in the field, for each additional segment of hydroelectric capacity that is added, a proportional segment of wind energy equal to 10% will also be developed.

In another vein, the government is asking Hydro-Québec to pursue a wind-diesel coupling project in Nunavik and to define an implementation system for wind-diesel coupling for all independent grids (not hooked up to the Hydro-Québec grid).

Energy efficiency

In addition to the production of renewable energy, Québec has also engaged in energy efficiency. Quebecers consume less energy per capita than all of Canada and the United States, but they are nonetheless large consumers of energy compared to the planet as a whole. Since the beginning of 2000, regulated energy distributors are required to develop comprehensive energy efficiency plans (CEEPS). Hydro-Québec's plan consists of 13 programs based on its clientele, that is, residential, commercial and industrial.

In 2010, Hydro-Québec's programs will save 4.1 TWh of electricity and generate a gain of over $1 billion for all customers combined. The two gas distributors, Gaz Métro and Gazifère, also offer programs to their residential and commercial customers. In 2008, their energy efficiency plans will have given rise to $25 million in investments and created energy savings of about 100 million cubic metres (Mm3) of natural gas, thereby **avoiding** approximately **3 Mt of GHGs** annually in 2012.

GHG EMISSIONS AVOIDED IN 2012 BY ENERGY TYPE

Energy Type	GHG emissions avoided in 2012
Hydroelectricity	5.0 Mt of CO_2 eq.
Wind power	2.9 Mt of CO_2 eq.
Energy efficiency	3.0 Mt of CO_2 eq.

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It is still possible for Quebecers to reduce their energy consumption and at the same time cut GHG emissions. To this end, Québec's energy strategy focuses on a more efficient use of all forms of energy, including petroleum products. For the first time, the government is putting forth a comprehensive plan covering all markets and all forms of energy, with the means to realize it. It is mandating the Agence de l'efficacité énergétique to draft this comprehensive energy efficiency plan for all energy distributors, and to achieve savings in areas that are relatively untapped at the moment, like transportation.

What is new about the plan is that it will include an energy savings target for the petroleum products sector of 2 million tonnes of oil equivalent by 2015, which equals 13.5 million barrels of petroleum, or a little more than 10% of our annual consumption of petroleum products in Québec. Targets for natural gas have more than tripled: the 2008 target of 96.9 million cubic metres increases to 350 million cubic metres in 2015. Finally, Hydro-Québec's energy efficiency target increases from 4.1 TWh in 2010 to 8.0 TWh by 2015. This is double the energy consumption of households in the greater Québec region.

Additional actions

IMPLEMENT A FINANCING PROGRAM AIMED AT ENERGY EFFICIENCY FOR INDIVIDUALS, INDUSTRIES, INSTITUTIONS, COMPANIES AND MUNICIPALITIES IN QUÉBEC

Energy efficiency serves to reduce or avoid the emission of substantial quantities of GHGs into the atmosphere and to achieve significant savings on the energy bill. Despite these advantages, individuals and administrators hesitate to implement energy efficiency measures on account of their profitability criteria. Often, energy efficiency projects are too costly or the return on investment periods too long compared to what companies and institutions have.

The Québec Government will create a program to finance projects aimed at energy efficiency in order to make it more appealing. This program is for individuals, institutions, small, medium and large industries, companies and municipalities.

AMEND QUÉBEC'S BUILDING CODE TO IMPROVE THE ENERGY PERFORMANCE OF NEW BUILDINGS AND HOMES BUILT IN QUÉBEC AS OF 2008

Current legislation for new buildings and housing is over 20 years old and so many of the provisions are outdated. The Québec Government will update its legislation with new energy performance requirements that will apply to new buildings and housing built as of 2008. These new requirements will cover building envelopes (insulation, air barriers, doors and windows) and mechanical and electrical systems (ventilation, heating, cooling, lighting, etc.).

Technical and economic studies will determine the precise levels of the new prescriptions, based on the voluntary Novoclimate standard for single and multiple unit housing. New standards for industrial, commercial and institutional buildings will target an energy performance equivalent to that of the federal Commercial Building Incentive Program.

2.1.2 Transportation

In Québec, transportation is the economic sector that emits the most GHG emissions and its emissions continue to rise. This is in spite of the fact that its automobile fleet has one of the best performances in Canada with respect to fuel consumption, and Montréal is one of the cities in North America where public transportation is used most. Several actions are currently underway to mitigate this sector's GHG emissions.

Each year, the Québec Government invests $350 million on average in public transportation projects. Through the multiple actions of government and its partners, public transportation use has increased by 8% in five years despite strong competition from automobiles. For example, the number of passengers riding commuter trains in the greater Montréal area has doubled in the last ten years. Two new routes are planned between now and 2009 – the line linking Blainville to Saint-Jérôme and the one linking downtown Montréal with Repentigny and Mascouche – will enable efforts to be pursued in this respect.

In its 2006-2007 budget, the Québec Government announced new investments of $1.5 billion over three years for public transportation and an action enabling employers to deduct 100% to 200% of the cost of public transit passes provided to their employees. Shortly, Québec's public transportation policy will be topping up investments in public transit. The budget also provides for a partial refund of Québec's sales tax (QST), up to $1,000, on the purchase of hybrid vehicles (gas/electricity) that consume 6 litres of fuel or less per 100 kilometres and a full refund of the fuel tax paid on the purchase of biodiesel.

Multimodal transportation rose in 2005, particularly in the maritime sector. Kruger opened up the market by introducing barges to ship its wood chips from Forestville to Trois-Rivières. Aluminerie Alouette announced its intention to use maritime transportation to ship 250,000 tonnes of aluminum to the continental market. These two innovative projects should enable us to reduce GHG emissions by 13,000 tonnes and 26,000 tonnes each year.

A change was made to registration fees, effective January 1, 2005, to reduce GHGs and the polluting emissions of vehicles. An additional registration charge has been applied to high-cylinder vehicles (4 litres and more), which will be reinvested in public transportation.

Finally, the Programme d'inspection et d'entretien des véhicules automobiles lourds (PIEVAL) came into effect on June 1, 2006. This program requires road transporters to improve maintenance on their vehicles, thereby reducing GHGs and other harmful emissions (fine particles, nitrogen oxides, hydrocarbons) by 82,000 tonnes each year.

Additional actions

UTILIZE THE NECESSARY MECHANISMS TO REQUIRE MANUFACTURERS OF LIGHT-DUTY VEHICLES SOLD IN QUÉBEC TO MEET A GHG EMISSIONS STANDARD STARTING IN 2010

In 2004, California introduced a new GHG emissions standard for light-duty vehicles. This new standard obliges automobile manufacturers to market vehicles that meet the maximum annually-set GHG emissions limit. Between 2009 and 2016, this standard will result in a decrease in GHG emissions in the order of 25% to 30% for new vehicles sold. Ten other American states including New York and several New England states have followed in California's footsteps and a number of states in the Midwest have announced their intention to follow suit.

The Government plans to use the mechanisms at its disposal to make the standards applicable to vehicles sold in Québec more restrictive with regard to GHG

emission reductions and energy consumption. The government wants the new standards to produce results for reductions in energy consumption similar to those expected of the standards set by the state of California for limiting the GHG emissions of vehicles.

AIM TO HAVE GAS DISTRIBUTORS INCLUDE A MINIMUM 5% OF ETHANOL IN THEIR TOTAL FUEL SALES BY 2012

The use of ethanol as a replacement fuel serves to reduce GHG emissions in the transportation sector. To facilitate access to this fuel, the Québec Government aims to have gas distributors include a minimum 5% of ethanol in their total fuel sales by 2012. This action will reduce gas consumption by 300 million litres.

It should be noted that the Québec Government intends to encourage local production of ethanol from forest biomass, agriculture and municipal waste, and not from grain corn. Although technologically more difficult, it is environmentally and economically more profitable for Québec. The government wishes to have an ethanol manufacturing demonstration plant using biomass in operation around 2008.

ENCOURAGE QUÉBEC'S MUNICIPALITIES TO ADOPT LEGISLATION BETWEEN NOW AND 2010 TO OFFSET THE EFFECTS OF IDLING MOTORS

Idling means letting a vehicle's engine run when the vehicle is not moving. An engine idling for 10 minutes a day consumes 100 litres of fuel each year on average. It also releases 254 kilograms of GHG emissions and several other atmospheric pollutants that are harmful to our health. Considering the 4.2 million vehicles in Québec, these emissions represent large quantities.

A few municipalities in Québec, including Montréal and Québec City, have decided to regulate idling within their jurisdictions. Montréal's by-law limits idling to three minutes. Certain vehicles are exempted, such as emergency and maintenance vehicles and taxis during the winter.

The Québec Government intends to encourage the other municipalities to adopt similar legislation.

ENCOURAGE THE DEVELOPMENT AND USE OF PUBLIC TRANSPORTATION

There is significant potential for GHG emission reductions in the transportation sector in urban areas. Public transportation includes urban and interurban public transportation, school transportation, adapted transportation, and public transportation in rural areas.

The government will encourage the development and use of public transportation by, among other things, financing the creation of reserved lanes and adopting preferential measures for public transportation, the purchase of electric or hybrid buses, the addition of commuter trains, and the improvement of metro infrastructures. It will also encourage increased use of public transportation over other forms of transportation.

ENCOURAGE THE DEVELOPMENT AND USE OF TRANSPORTATION ALTERNATIVES

In addition to public transportation there are several other ways to avoid solo driving on a daily basis. Car sharing, carpooling and active transportation (cycling, walking, etc.) are just some of the viable solutions that the government must absolutely promote to the population and companies. Workers who bike to work improve their physical fitness. They do not generate GHGs or atmospheric pollution and they help to reduce urban smog and noise pollution. To promote this form of alternative transportation, it is essential to develop safe bike paths that run from residential neighbourhoods to the work areas, like the city cores, industrial parks, shopping centres, and facilities within the education networks.

Also, carpooling and active transportation lower commuting costs for people, and reduce urban congestion and related GHG emissions.

The government intends to encourage the use of these alternative modes of transportation by setting up a program to finance the infrastructures.

ENCOURAGE IMPLEMENTATION OF INTERMODAL PROJECTS FOR THE TRANSPORTATION OF MERCHANDISE

It is essential that shippers have access to efficient cost effective transportation systems that will allow them to be competitive on markets that are increasingly further away. The optimal use of all maritime and rail transportation infrastructures and networks as a complement to road transportation, as well as improved integration of these networks, are vital in achieving sustainable development.

The Ministère des Transports, which will be responsible for this action, will seek a better balance between the different transportation modes in Québec's existing network, while aiming to protect the environment, maintain security and ensure adequate road management. It will also encourage increased use of public transportation over other forms of transportation.

IMPLEMENT A SUPPORT PROGRAM FOR THE MARKETING OF TECHNOLOGICAL INNOVATIONS IN ENERGY EFFICIENCY IN THE TRANSPORTATION OF MERCHANDISE

The transportation of merchandise is an essential component of our economic growth. Between 1990 and 2003, GHG emissions generated by heavy-duty vehicles increased by 41%. To reduce these emissions, it is necessary to make the most of technological innovations that make road transportation more efficient and thereby improve this sector's competitiveness.

With this action, the government will encourage the introduction of new technologies in energy efficiency and the reduction of GHG emissions of trucking companies. The financing program will facilitate access to the best performing operating assistance systems (OAS), electric feed systems, onboard computers and new more energy efficient engines.

With regard to maritime and rail transport, the government will focus on investments to improve technologies and techniques designed to make ships and locomotives more efficient.

ADOPT LEGISLATION REQUIRING MANDATORY USE OF SPEED LIMITING DEVICES ON ALL TRUCKS AND SETTING THE MAXIMUM SPEED FOR THESE VEHICLES AT 105 KM/HR

A speed limiter is an integrated circuit that controls the maximum speed of a vehicle. Most trucks built in the last ten years are equipped with this technology. The regulation will cover all heavy-duty vehicles registered in Québec.

This action will result in fuel savings in the order of 10,500 litres per truck (tractor and semi-trailer), which will translate into annual savings of $8,000 a year per truck in terms of fuel consumption, calculated on the basis of 200,000 km per year.

2.1.3 Québec's industrial sector

Overall, Québec's industrial sector reduced its GHG emissions by 6.8% between 1990 and 2003. It is nonetheless responsible for over 31% of the GHG total. The major GHG emitting industries in Québec are in the aluminum, pulp and paper, petroleum refining, metals, cement and chemicals sectors. It is therefore essential to encourage industry leaders to take action to further cut GHGs. A voluntary approach has already produced results in Québec with agreements made in 2002 with the Aluminum Association of Canada and specific agreements with Alcoa, Alcan and Aluminerie Alouette. These agreements alone served to reduce GHG emissions by some 550,000 tonnes of CO_2 equivalent per year.

Also, to expand its knowledge of emissions from the industrial sector, the government intends to adopt a regulation obliging major emitters to declare their GHG emissions and other contaminants.

NEGOTIATE VOLUNTARY AGREEMENTS FOR THE REDUCTION OF GHGS IN QUÉBEC'S INDUSTRIAL SECTOR

Negotiations will be initiated over the next few months between the government, industrial associations and large companies in order that the large emitters of GHGs can make commitments based on their financial capacity, available technology and competitiveness on Canadian and international levels. These negotiations should result in voluntary agreements, above all in those sectors where the potential gains are most significant.

IMPLEMENT THE REGULATION RESPECTING HALOCARBONS

Adopted in 2004, the Regulation respecting halocarbons aims to reduce halocarbons in the atmosphere by banning CFCs and halons. It also requires that appliances containing halocarbons be recovered or emptied before initiating work that may release emissions, and requires those handling halocarbons to be environmentally qualified.

2.1.4 Residual materials

IMPLEMENT THE REGULATION RESPECTING THE LANDFILLING AND INCINERATION OF RESIDUAL MATERIALS

Biogas generated by anaerobic decomposition (in the absence of oxygen) of organic matter in landfill sites is a major air quality contaminant due to the emission of large quantities of methane, which contribute to global warming. Methane is considered to be 21 times more damaging than carbon dioxide in its contribution to the greenhouse effect.

In 2005, the Québec Government adopted important legislation which notably aims to minimize the impact of biogas released from landfill sites. The Regulation respecting the landfilling and incineration of residual materials contains several provisions aimed at controlling biogas emissions and continuously monitoring the efficiency of equipment installed for that purpose. From now on, all technical landfill sites (TLSs) must manage the biogas they generate. The larger TLSs, which handle an annual total of 50,000 tonnes of residual materials, will be required to capture their biogases, ideally for recovery or incineration.

FINANCIAL SUPPORT FOR THE CAPTURE OF BIOGAS FROM LANDFILL SITES NOT SUBJECT TO THE REGULATION

Québec must eliminate 6.4 Mt of residual materials each year, mostly through landfilling. In 2003, some 5.4 Mt of CO_2 equivalent was released by landfill sites

in Québec. In 2005, the Québec Government regulated the GHG emissions of new TLSs and major expansions of existing sites. But there are many smaller sites, however, that are closed or to be closed in the years to come, that are not regulated by Québec's new legislation. There is an interesting potential for reducing GHG emissions at these sites and the government intends to provide financing to install equipment to capture biogas for incineration or recovery.

The government announced in its energy strategy its intention to deregulate biogas distribution activities to facilitate the recovery process.

2.1.5 Agriculture

IMPLEMENT AN AID PROGRAM FOR WASTE TREATMENT AND ENERGY RECOVERY OF AGRICULTURAL BIOMASS

Québec's agriculture sector released 8.5 Mt of CO_2 eq. in 2003. Nearly 30% of this sector's emissions are related to waste management. There are several technologies and comprehensive management scenarios available for these materials that could significantly reduce GHGs. The government will set up financing for a management approach that allows for fewer GHGs to be generated by waste. The program will also finance energy recovery of agricultural biomass.

2.1.6 Government leadership

The Québec Government intends to set the example in the fight against climate change by reducing GHG emissions generated by government operations, notably those generated by public buildings and its fleet of light-duty vehicles.

Total GHG emissions for all public buildings in Québec have been reduced by more than 15% on average since 1990 through the implementation of energy efficiency actions. Despite this good performance, there are still significant possibilities for reducing the GHG emissions of public buildings.

With regard to transportation, several departments have acquired light-duty hybrid vehicles, and parking subsidies for government employees will be abolished in 2009. Finally, the Ministère des Transports set up a program in 2002 to minimize GHG emissions produced by its employees in their daily travels.

Additional actions

BY 2010, IMPROVE ENERGY EFFICIENCY OF PUBLIC BUILDINGS BY 10% TO 14% UNDER THE 2003 LEVEL AND REDUCE THE FUEL CONSUMPTION OF GOVERNMENT DEPARTMENTS AND PUBLIC ORGANIZATIONS BY 20%

The government intends to keep up its good performance in energy efficiency in public buildings by asking school boards and the Société immobilière du Québec to improve the energy efficiency of their buildings by 10% over 2003. The target is 14% for institutions of higher learning and those of health and social services, and the target for the other departments and organizations is 12%.

Moreover, all new buildings in the public network, as well as expansions and major renovations will require new energy performances. This will translate into an improvement of at least 20% over the standards set for new buildings in compliance with the *Model National Energy Code for Buildings*, until Québec's new building code takes effect in 2008.

The Québec Government wants to set an example in transportation by reducing by 20% the fuel consumption of departments and organizations by 2010 over 2003. It will conduct an annual audit of the use of vehicles and travels. To do so, it will adopt rules to improve on all business trips, make drivers more aware of ecoenergetic driving and establish more environmentally friendly criteria

for the purchase of vehicles, etc. Finally, the government will improve maintenance of its fleet of vehicles and expand training programs for maintenance personnel and vehicle users.

These actions will be carried out in collaboration with the Agence de l'efficacité énergétique. An auditing mechanism for the ministeries and organizations will be integrated into their management plan.

REQUIRE EACH GOVERNMENT DEPARTMENT TO DEVELOP A PROGRAM BY 2008 TO REDUCE GHG EMISSIONS GENERATED BY EMPLOYEES COMMUTING TO WORK

This type of program consists in carrying out a study of the daily commutes of employees going to work and proposing alternatives to solo driving. Such a program could include the following actions: financing monthly passes for public transportation, reserving parking spaces for carpoolers, creating a carpooling Web site, providing a shuttle service for cyclists, improving bike access to work sites by providing secure parking areas, cubby holes, and showers.

By 2008, like the Ministère des Transports, each department must acquire a program to reduce GHG emissions generated by the daily travels of government employees.

2.1.7 Public awareness

Human activities contribute to global warming. This makes it necessary to change habits and make people aware of the urgency to fight climate change and to keep abreast of the different means available to succeed. For this purpose, several initiatives to raise public awareness of the impacts of climate change were carried out in recent years in Québec.

In 2004, the Québec Government contributed to the creation of the Centre québécois d'action sur les changements climatiques (CQACC) whose mission consists of gathering and disseminating information on climate change in order to pose concrete actions and reduce Québec's GHG emissions. Since its creation, the CQACC has realized many public awareness campaigns with target clienteles. In addition, the CQACC perfected a software program to calculate the GHG emissions of citizens according to their activities and lifestyles.

The Société de l'assurance automobile du Québec (SAAQ) added new ecoenergetic tips in its *Driving a Passenger Vehicle* guide. The SAAQ will soon be introducing an energy efficiency component in its written driving tests. Through this initiative, new drivers will be fully aware of the impacts of automobiles on the environment and the different means available to minimize these impacts, which will also enable them to save energy.

Additional actions

LAUNCH A PUBLIC AWARENESS CAMPAIGN FOR SOLUTIONS TO CLIMATE CHANGE

The Québec Government expects to launch a public awareness campaign on the importance of being actively involved in the fight against climate change. The campaign will focus on ecoenergetic appliance choices for the home, ecoenergetic automobiles, the promotion of alternatives to solo driving and the advantages of reducing driving speeds, and finally, adopting environment friendly practices and habits.

The campaign will be realized in partnership with non-governmental organizations in Québec that are active in the field of climate change.

IMPLEMENT A TRAINING PROGRAM FOR QUÉBEC COMPANIES AND ORGANIZATIONS ON THE DIFFERENT CO_2 CREDIT SYSTEMS

Since implementation of the Kyoto Protocol, an international market of GHG emission credits is developing and will be functional in 2008. European countries set up the same type of market in January 2005, which will be compatible with the future international market of emission reduction credits. In the United States, emission reductions are already being traded on a carbon market (Chicago Climate Exchange) and the Northeastern States are setting up a system of exchangeable permits for energy producers, which Québec could join.

The Canadian federal government is currently studying a system of exchangeable permits for certain large industrial emitters and a system of CO_2 emissions credits.

Development of these systems could generate business opportunities for organizations and companies in Québec active in the sectors of biogas recovery, agricultural, forest and municipal biomass, CO_2 sequestration, renewable energy and energy efficiency. It is therefore in Québec's interests to prepare its companies for these potential markets and encourage the realization of GHG emission reduction projects. Also, training will be offered to Québec companies and organizations on the national and international mechanisms for the creation of credits. Market studies and business missions could also be carried out in addition to the development of protocols for the quantification of emission reductions.

2.1.8 Research, development and deployment of technologies

As part of the fight against climate change, it goes without saying that long term reductions will be achieved in large part as a result of low-emitting technologies and their implementation. There are interesting markets available to companies active in the development of technologies related to renewable energies, biofuels, energy efficiency, biomass recovery, development of hydrogen technologies, etc. In Québec, research and development (RD) in technologies related to climate change has risen significantly in the last few years.

Since 2002, several technological innovations in Québec in the fields of energy efficiency, waste and biogas recovery, waste treatment and renewable energy saw the light of day thanks to the Québec Government's Technology Showcase Assistance Program. These technologies, which will serve to reduce GHG emissions generated by these sectors, suggest very interesting export prospects in a context where CO_2 markets are developing quickly on both sides of the Atlantic.

Several other technologies of interest have been developed in recent years in transportation: electric motorization systems developed by TM4I (Hydro-Québec subsidiary), the miniaturization of heating systems for cabs, and new lighter but stronger metals for the automotive industry. In addition, Québec created a hydrogen research institute in recent years as part of the Université du Québec à Trois-Rivières. This organization conducts advanced research on the production, storage and energy uses of hydrogen, which is a field that shows promise.

Additional actions

IMPLEMENT A PROGRAM TO SUPPORT TECHNOLOGICAL RESEARCH AND INNOVATION FOR THE REDUCTION AND SEQUESTRATION OF GHGS

The Québec Government has identified the most promising R&D niches for Québec, taking the existing organizations, current university expertise and manufacturing potential into account. These niches include recovery of forest, agricultural and municipal biomass, the capture and sequestration of GHG emissions, geothermal energy, solar energy and hydrogen.

2.1.9 Climate change economic instruments

Economic instruments are part of the tools available to governments to set up GHG emission reduction plans. Since traditional market laws and regulations do not always give the desired results in environmental terms, use of these instruments to change behaviours is highly recommended by organizations like the Organisation for Economic Co-operation and Development (OECD) and the Canadian Council of Ministers of the Environment (CCME).

Hydrocarbons used mostly in transportation and building heating are responsible for 72% of Québec's GHG emissions. To achieve significant GHG reductions, it makes sense to target these energy sources using the different tools available, whether they are regulatory, economic (incentives) or voluntary.

Since the Sustainable Development Act came into force in April 2006, the Ministère du Développement durable, de l'Environnement et des Parcs created a Green Fund, which can be funded by sums collected through the application of economic instruments.

The financing of the actions contained in this plan and complementary to the energy strategy would come from hydrocarbon royalties applied to GHG-emitting businesses in the energy sector.

The Régie de l'énergie will establish these royalties, which will be calculated on the basis of CO_2 equivalents for each form of energy.

The sums resulting from these levies will be paid into the Green Fund of the Ministère du Développement durable, de l'Environnement et des Parcs, which will serve to finance the actions of the plan.

The financing requirements of the Green Fund are estimated at $200 million per year.

The legislative and regulatory modifications required will be made in a fair and transparent way.

The following table summarizes all the GHG emission reduction actions for 2006-2012 expected from this plan. Information is available in the Appendix.

CATEGORIES OF ECONOMIC INSTRUMENTS

Economic instruments can be classified into two categories: fiscal and non-fiscal instruments. In the first category are ecotaxes, user pay, and tax and financial compliance incentives. The second category consists of exchangeable permits and consignment.

GHG EMISSION REDUCTIONS TO BE REACHED BY 2012

Sector	GHG emission reduction
Energy and transport (actions covering technological innovation, energy efficiency in buildings, replacement fuels, transportation of persons and merchandise)	4.8 Mt CO_2 eq.
Industrial sector (voluntary agreements and Regulation respecting halocarbons)	1.6 Mt CO_2 eq.
Implementation of Regulation respecting the landfilling and incineration of residual materials and biogas capture in existing landfill sites	3.0 Mt CO_2 eq.
Agricultural (waste treatment and recovery of agriculture biomass)	0.3 Mt CO_2 eq.
Government leadership	0.2 Mt CO_2 eq.
Public awareness	0.1 Mt CO_2 eq.
TOTAL	**10.0 Mt CO_2 eq.**

Additional actions

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Since the Sustainable Development Act came into force in April 2006, the Ministère du Développement durable, de l'Environnement et des Parcs created a Green Fund, which can be funded by sums collected through the application of economic instruments.

The financing of the actions contained in this plan and complementary to the energy strategy would come from hydrocarbon royalties applied to GHG-emitting businesses in the energy sector.

The Régie de l'énergie will establish these royalties, which will be calculated on the basis of CO_2 equivalents for each form of energy.

The sums resulting from these levies will be paid into the Green Fund of the Ministère du Développement durable, de l'Environnement et des Parcs, which will serve to finance the actions of the plan.

The financing requirements of the Green Fund are estimated at $200 million per year.

The legislative and regulatory modifications required will be made in a fair and transparent way.

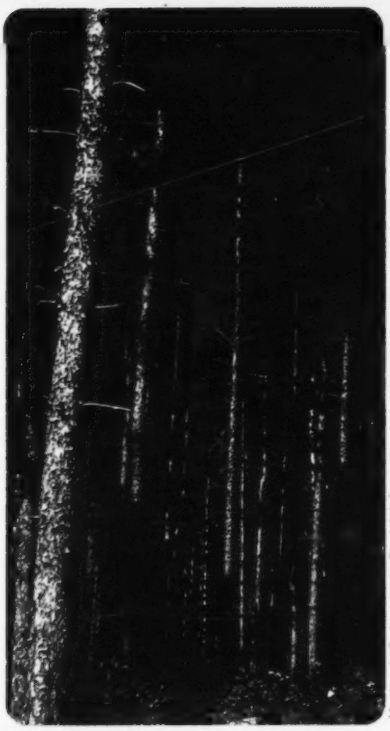
The following table summarizes all the GHG emission reduction actions for 2006-2012 expected from this plan. Information is available in the Appendix.

CATEGORIES OF ECONOMIC INSTRUMENTS

Economic instruments can be classified into two categories: fiscal and non-fiscal instruments. In the first category are ecotaxes, user pay, and tax and financial compliance incentives. The second category consists of exchangeable permits and consignment.

GHG EMISSION REDUCTIONS TO BE REACHED BY 2012

Sector	GHG emission reduction
Energy and transport (actions covering technological innovation, energy efficiency in buildings, replacement fuels, transportation of persons and merchandise)	4.8 Mt CO_2 eq.
Industrial sector (voluntary agreements and Regulation respecting halocarbons)	1.6 Mt CO_2 eq.
Implementation of Regulation respecting the landfilling and incineration of residual materials and biogas capture in existing landfill sites	3.0 Mt CO_2 eq.
Agricultural (waste treatment and recovery of agriculture biomass)	0.3 Mt CO_2 eq.
Government leadership	0.2 Mt CO_2 eq.
Public awareness	0.1 Mt CO_2 eq.
TOTAL	**10.0 Mt CO_2 eq.**



2.2 CONTRIBUTION EXPECTED FROM THE FEDERAL GOVERNMENT

The actions described in this action plan will enable the Québec Government to reduce GHG emissions by 10 Mt of CO_2 equivalent under the level projected for 2012, according to a provisional business as usual scenario (BAU). This means emissions for 2012 would be lowered from 94 Mt of CO_2 equivalent to 84 Mt of CO_2 equivalent.

IMPACT OF THE ACTION PLAN ON GHG EMISSIONS

GHG Emissions	Mt
1990 level	85.3
2003 level	90.9
Projected emissions for 2012 according to BAU	94.0
Effort provided by Québec's action plan	10.0
Impact of action plan on emissions projected for 2012	84.0
Application of Canadian GHG reduction objective to Québec (6% under 1990 level) for 2012	80.2
Extra effort to provide to achieve 6% reduction of GHG emissions under 1990 level by 2012	3.8

The Québec Government is not the only government whose actions on Québec's territory might have an impact on reduction of CO_2 equivalent emissions. The federal government must also play an active role in this area, especially given that Canada's emissions of CO_2 equivalent increased by more than 27% between 1990 and 2004.

As part of the discussions that followed in the wake of Canada's ratification of the Kyoto Protocol and implementation of a Canadian climate change plan, the Québec Government repeatedly demanded recognition of the emissions avoided as a result of its large production of renewable energy. It also required that the GHG emission reductions achieved by its large industrial emitters since 1990 (9.7% from 1990 to 2003) be taken into account in an eventual system of exchangeable permits aimed at large final emitters in Canada. The government intends to pursue these discussions with the federal government on these issues in order to ensure that Québec's specificity is respected with regard to GHG emissions. The government also considers essential the federal government's financial participation in this action plan by means of a budget in the order of $328 million.

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2.3 ACTIONS TARGETING QUÉBEC'S ADAPTATION TO CLIMATE CHANGE

Warming is expected to occur throughout Québec, with more intense warming in northern areas and in Hudson Bay. Variations in precipitation are also projected to occur across the territory, as well as a possible increase in periods of intense heat, droughts and winter warm spells. Finally, the projected sea level rise could cause flooding and increased coastal erosion.

Québec's economy is particularly vulnerable to the impacts of climate change because several of its sectors rely on the harvesting, transformation and use of natural resources. Therefore, the abundance and quality of our natural resources in many cases depend on the climate. For example, Québec's forest industry is highly susceptible to insect epidemics, forest fires, disease and damage caused by extreme events like the ice storm in 1998. There is a strong chance that climate change will exacerbate some of these problems and could affect both the profile and the yield of Québec's forest industry.

Even if there is still a great deal of uncertainty over the scope and timing of the impacts of climate change in Québec, research thus far indicates that they are inevitable and will have significant consequences for Québec society. The principle of precaution requires that we prepare now.

Work underway by the Ouranos Consortium supports the implementation of adaptation actions. These actions are in the fields of health, environment, resources and the territory and essentially aim to prepare Québec society for adaptation to the impacts of climate change. Ouranos is also carrying out climate change projections using several models, including the regional climate model for Canada.

2.3.1 Health

Climate change could have significant impacts on human health. For example, an increase in infectious diseases, heat waves and certain extreme climate events are likely to have repercussions on the population's mortality rate, particularly for vulnerable individuals (the elderly, homeless, children, etc.).

The effects of climate change could be mitigated, however, through preventive action, by improving knowledge and setting up alert and monitoring systems.

The Québec Government initiated several actions in recent years to prepare the population for the impacts of climate change. By 2007, several regions must implement an emergency preparedness strategy to deal with heat waves. Some actions included in these regional emergency plans include providing assistance for individuals at risk, designating areas where people can cool off, distributing water to the homeless and applying appropriate actions for patients in hospital or at home.

Additional actions

INTRODUCE MECHANISMS TO ALLOW FOR PREVENTING AND MITIGATING THE IMPACTS OF CLIMATE CHANGE ON HEALTH

In order to mitigate the negative impacts of climate change on the health of Quebecers, the Québec Government will set up two monitoring systems. First, it will set up an alert and monitoring system for intense heat and for monitoring health problems related to climate change in areas likely to be affected. Second, the government will introduce a short and long term epidemiological monitoring system for physical and psychosocial health problems related to extreme climate events.

Also, systems for monitoring infectious disease will be improved to allow for quickly detecting pathogenic agents and diseases whose development is accelerated by climate change. Training on these diseases and emerging health problems will be offered to workers in the public health, clinical services and civil protection sectors. Also, panels of experts will be created to advise health facility administrators on the actions to take to ensure that buildings and infrastructures are adequately prepared to resist the harmful effects of heat.

Finally, the government will provide financial support for the creation of cool areas (tree planting, creation of parks, installation of municipal pools, etc.) in urban areas and cooling for strategic infrastructures (hospitals, homes for the elderly, schools, etc.) to mitigate the impact of summer heat waves on the population.

2.3.2 Environment, natural resources and the territory

The characteristics, scope and speed of climate change could vary depending on the area in Québec. Also, the effects on terrestrial and aquatic environments will have repercussions on neighbouring communities and their socioeconomic activities. This makes it necessary to monitor climate change and its impacts on natural and built environments. Monitoring networks and programs are an unavoidable part of the fight against climate change and its impacts on Québec's different socioeconomic sectors.

The government is currently reviewing the air quality monitoring network as part of the Canada-Québec agreement on the atmospheric pollution monitoring program. This will serve to better monitor the presence of atmospheric pollutants that are harmful to human health. Since the chemical composition of these pollutants and how they are formed are conditioned by the climate, it is necessary to have a better understanding of the repercussions of climate change on air quality in order to more fully understand the trends.

North of the 55th parallel, in Nunavik, the government has installed or reinstated automated systems for measuring the permafrost thermal regime at different depths under the transportation infrastructures it owns. This followup is being carried out at the seven northern airports deemed very sensitive to accelerated permafrost thawing. These systems will collect temperature data in order to track permafrost conditions and the impacts caused by thawing for the purpose of improving adaptation actions, if needed. Also, permafrost characterizations (geophysical sampling and drilling at shallow depths) are being carried out by Université Laval researchers at certain airports to learn more about these characteristics.

In other respects, the Québec Government in collaboration with the Institut national de la recherche scientifique is monitoring coastal erosion and protection barriers, notably on the North Shore.

Other studies will provide a better understanding of the impacts that natural and human perturbations have on Québec's forest carbon reservoirs. They will serve to identify how forest management and forest practices can contribute to mitigating climate change.

Additional actions

CONSOLIDATE THE MONITORING NETWORKS FOR CLIMATE, WATER RESOURCES AND UNDERGROUND WATER

Indispensable is the need to consolidate the environmental monitoring networks and adapt them in order to adequately quantify trends and the scope of changes that are underway, evaluate their impacts and develop adaptation actions. Developing these actions requires access to reliable climatological data, interpretation data and indicators adapted to climate change. Also, expected fluctuations in the hydrological regime risk having harmful effects on the quantity, quality and use of water supplies. In the same vein, increased use and the replenishing capacity of aquifers, which could be dramatically affected, are situations that must be closely monitored

For these reasons, the government intends to invest in the consolidation and modernization of the climatological network and the hydrometric network, in this case by prioritizing the section of the network north of the 50th parallel. Also, it will continue to develop a network for monitoring the watertable.

Also, the government intends to provide for needs related to analysis, interpretation and distribution related to the production of climatological data, the need for interpretation tools and indicators adapted to climate change and an understanding of their repercussions on air quality.

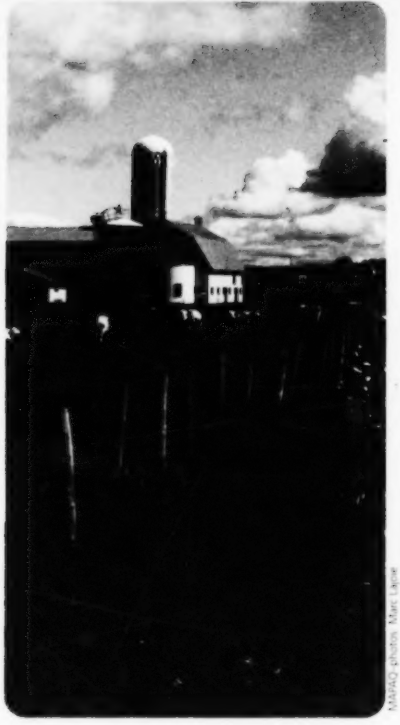
EXPERIMENT WITH MEANS TO MITIGATE THE IMPACTS OF THE PERMAFROST MELTING ON TRANSPORTATION INFRASTRUCTURES

The impacts of climate change on certain sensitive areas, such as the permafrost melting, will also have an impact on the transport infrastructures in those areas. A research project will allow for testing three methods for mitigating the effects of the melting permafrost on Nunavik's transportation infrastructures. Spanning three years, the project is slated to begin in June 2006 and the study site is the access route between Salluit on the Hudson Strait and its airport.

DETERMINE THE VULNERABILITY OF QUÉBEC'S FORESTS AND FOREST INDUSTRY TO CLIMATE CHANGE AND INTEGRATE THE ANTICIPATED IMPACTS INTO FOREST MANAGEMENT PRACTICES

Climate and forests are indissociable. Climate largely determines the composition and distribution of forests in a highly dynamic relationship. Decisions taken today will influence the forests for a very long time. The young forests today and those that will be planted may be affected by climatic conditions that differ quite dramatically from those of today. It is therefore important that forest workers integrate climate considerations immediately into their planning and practices.

First, a study on the vulnerability of forests and forest sector to climate change will be carried out. Then, climate scenario simulations done by the Ouranos Consortium will be integrated into the planning of forest practices according to the vulnerabilities that are identified.



MAMQ photo, Marc Lajoie

2.4
THE ACTION PLAN'S ACCOUNTABILITY MECHANISM

In order to focus its priorities and plan its actions to reach the objectives it has set, the government intends to set up an accountability mechanism.

Within the year following the unveiling of this document, the departments and organizations responsible for implementing actions will submit indicators to the government, which they will be required to evaluate on a yearly basis to monitor and measure progress. Three years following adoption of the action plan, the government will release a progress report.

Marc Lajoie, ministère de l'Agriculture, des Pêcheries et de l'Alimentation

3.
CONCLUSION

Québec ranks among the most progressive governments on the planet in the fight against climate change and its energy profile is unique in North America. The reduction and avoidance of GHG emissions and adaptation to climate change require that new technologies be developed and used and that energy efficiency improves in several sectors of the economy.

To this effect, the 2006-2012 action plan has two main objectives: the mitigation of GHG emissions and adaptation to climate change. The emissions reduction objective Québec wishes to reach is the same one it committed to in 2001 as part of the *Conference of New England Governors and Eastern Canadian Premiers Climate Change Action Plan*. Québec had then committed to contributing to the regional target for GHG emission reductions, that is, 10% in 2020 under the 1990 level. The 2006-2012 Action Plan is the first step towards reaching this objective.

Québec's GHG emissions record demonstrates that the sectors causing the greatest overall increase in GHG emissions in Québec are building and transportation. As a result, the proposed emission reduction actions mainly target these two economic sectors, which have seen increases in their emissions since 1990. Actions are also aimed at reducing GHG emissions in government sectors, through information and public awareness and RDD. Other actions include adapting to climate change, with health and environment as the priorities.

The new actions that will generate GHG emission reductions enable Québec to adopt a realistic and ambitious reduction objective for the next six years of 10 Mt of CO_2 equivalent which will lower the level of GHG emissions to 84.0 Mt of CO_2 equivalent in 2012, that is, 1.5 % below the 1990 level.

The Québec Government is once again demonstrating its leadership in the fight against climate change and is appealing to the federal government to collaborate by contributing financially to this action plan as well as undertaking other actions for the reduction of GHGs and adaptation to climate change.

The Québec Government is calling on all actors in Québec to commit to the principles of sustainable development and rise to the challenges of climate change.

APPENDIX

APPENDIX
POTENTIAL FOR AVOIDANCE AND REDUCING GHGS AND GOVERNMENT COSTS

	Avoidance or reduction actions [1]	Total avoidance/reduction potential in 2012 [2] (CO_2 equivalent)	Total cost of actions for the 2006 - 2012 period ($'000)	Average annual cost for the 2006-2012 ($'000)	Departments/ organizations responsible
1.	Implement a financing program aimed at energy efficiency for individuals, industries, institutions, companies and municipalities in Québec	600 kt	150,000	25,000	AEE
2.	Amend Québec's building code to improve the energy performance of new buildings and homes built in Québec as of 2008	50 kt	-	-	AEE
3.	Adopt the necessary mechanisms to require manufacturers of light-duty vehicles sold in Québec to meet a GHG emissions standard starting in 2010	1,700 kt	-	-	MDDEP / MTQ
4.	Aim to have gas distributors include a minimum 5% of ethanol in their total fuel sales by 2012	780 kt	30,000	5,000	MRNF
5.	Encourage Québec's municipalities to adopt legislation between now and 2010 to offset the effects of idling motors	210 kt	4,200	700	MDDEP
6.	Encourage the development and use of public transportation	100 kt	720,000	120,000	MTQ
7.	Encourage the development and use of transportation alternatives	30 kt	60,000	10,000	MTQ
8.	Encourage implementation of intermodal projects for the transportation of merchandise	80 kt	60,000	10,000	MTQ
9.	Implement a support program for the marketing of technological innovations in energy efficiency in the transportation sector	900 kt	30,000	5,000	MTQ / AEE
10.	Adopt legislation requiring mandatory use of speed limiting devices on all trucks and setting the maximum speed for these vehicles at 105 km/hr.	330 kt	-	-	MTQ
11.	Negotiate voluntary agreements for the reduction of GHGs in Québec's industrial sector	940 kt	1,200	200	MDDEP
12.	Implement the Regulation respecting halocarbons	700 kt	-	-	MDDEP
13.	Implement the Regulation respecting the landfilling and incineration of residual materials	500 kt	-	-	MDDEP
14.	Financial support for the capture of biogas from landfill sites not subject to the Regulation	2,500 kt	18,000	3,000	MDDEP
15.	Implement an aid program for waste treatment and energy recovery of agricultural biomass	300 kt	24,000	4,000	MAPAQ
16.	By 2010, improve energy efficiency of public buildings by 10% to 14% under the 2003 level and reduce the fuel consumption of government departments and public organizations by 20%	150 kt	-	-	AEE
17.	Require each government department to develop a program by 2008 to reduce GHG emissions generated by employees commuting to work	20 kt	9,000	1,500	MDDEP / MTQ
	Sub-total	**9,890 kt**	**1,106,400**	**184,400**	

1) All actions that do not incur costs are financed through the regular budgets of the departments and organizations or as part of Québec's energy strategy.
2) Evaluations of avoiding/reduction potential are provided for information purposes and constitute forecasts.

	Awareness raising actions	Total avoidance/reduction potential in 2012 [a] (CO_2 equivalent)	Total cost of actions for the 2006 - 2012 period ($'000)	Average annual cost for the 2006-2012 ($'000)	Departments/ organizations responsible
18.	Launch a public awareness campaign for solutions to climate change	100 kt	12,480	2,080	MDDEP
19.	Implement a training program for Québec companies and organizations on the different CO_2 credit systems	-	3,000	500	MDEIE
	Sub-total	**100 kt**	**15,480**	**2,580**	

	Actions in research, development and deployment of technologies	Total avoidance/reduction potential in 2012 [a] (CO_2 equivalent)	Total cost of actions for the 2006 - 2012 period ($'000)	Average annual cost for the 2006-2012 ($'000)	Departments/ organizations responsible
20.	Implement a program to support techological research and innovation for the reduction and sequestration of GHGs	-	30,000	5,000	MDEIE / AEE
	Sub-total	**-**	**30,000**	**5,000**	

	Adaptation actions	Total avoidance/reduction potential in 2012 [a] (CO_2 equivalent)	Total cost of actions for the 2006 - 2012 period ($'000)	Average annual cost for the 2006-2012 ($'000)	Departments/ organizations responsible
21.	Introduce mechanisms to allow for preventing and mitigating the impacts of climate change on health	-	30,000	5,000	MSSS
22.	Consolidate the monitoring networks for climate, water resources and underground water	-	12,000	2,000	MDDEP
23.	Experiment with means to mitigate the impacts of permafrost thawing on transportation infrastructures	-	120	20	MTQ
24.	Determine the vulnerability of Québec's forests and forest industry to climate change and integrate the anticipated impacts into forest management practices	-	6,000	1,000	MRNF
	Sub-total	**-**	**48,120**	**8,020**	

Total		**9,990 kt**	**1,200,000**	**200,000**	

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